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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,207	04/09/2001	Guy L. Steele JR.	004-4667	6849

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EXAMINER

KIM, KENNETH S

ART UNIT	PAPER NUMBER
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2111

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/829,207

Applicant(s)

STEELE ET AL.

Examiner

Kenneth S KIM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 13-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 47-69 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

KENNETH S. KIM  
PRIMARY EXAMINER

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4 5 6.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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1. Claims 1-12 and 47-69 have been elected for examination, and claims 13-46 remain non-elected.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 47-69 are rejected under 35 U.S.C. 102(b) as being anticipated by Arnold, U.S. Patent No. 5,081,572.

Arnold teaches the invention as claimed in claim 47 including a method of operating a computer system that includes a memory shared by plural processors (col. 1, line 8) thereof, the method comprising:

(a) in response to execution of a single instruction by one of the processors (col. 5, line 20),

(b) separately reserving plural locations of the memory (second and fourth operands; col. 5, line 59),

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(c) signaling a fault (col. 5, line 61) corresponding to a later reserved one (fourth operand) of the locations based on a value read from an earlier reserved one of the locations (second operand; col. 5, line 62), and

further teaches as in claims 48-54,

(d) wherein, unless the value read from the earlier reserved location compares to a corresponding test value, no fault corresponding to the later reserved location is signaled (col. 5, line 61) – claim 48,

(e) wherein separately reserving includes separately locking at least the plural locations (col. 6, line 60; col. 3, line 35) – claim 49,

(f) wherein the computer system further includes cache storage and separately locking respective cache lines associated with the plural locations (well known that cache is accessed and locked in atomic operations on line basis; for in connection with CAS, see submitted reference AN by Greenwald, sections 5.3 and 5.4) – claim 50,

(g) wherein cache storage includes coherently maintained set of caches respectively associated with each of the plural processors (well known that in multiprocessor system shared memory cache coherency is maintained; for in connection with CAS, see submitted references AN and AQ, SPARC at p151) – claim 51,

(h) wherein the instruction implements a compound (or double) compare and swap operation and identifies operands as one of the plural locations (col. 2, line 30; col. 6, line 30) – claims 52-54.

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The method claims 55-58 (for signaling fault depending on a result of the first memory location access), the processor claims 59-62, the program product claims 63-68, and the apparatus claim 69 is equivalently rejected based on the same reason.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold, U.S. patent No. 5,081,572.

Arnold teaches the invention substantially as claimed as set forth in paragraph 3 above, however, does not expressly state that concurrently executed instructions each reserve a plurality of memory locations in a predetermined order.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made that the instructions can reserve memory locations in any order, and that a reservation in a predetermined order is a subset of all possibilities. The person would have been motivated to reserve memory locations in a predetermined address order, when such ordering offers an advantage. (There is no limitation indicating how the predetermined ordering is utilized.)

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Parks taught a method of providing cache coherency and cache line based atomic (locked) memory operation in a multiprocessor system.

Merchant taught a method of maintaining cache coherency in a multiprocessor system.

Greenspan et al taught a method of executing double compare and swap instructions.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth S KIM whose telephone number is (703) 305-9693. The examiner can normally be reached on M-F (8:30-17:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on (703) 305-4815. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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April 2, 2004



KENNETH S. KIM  
PRIMARY EXAMINER